above, but that the surgeon is sometimes compelled to use irrigation and drainage.

In 1897 Dr Calot of Berk-sur-Mer reintroduced the method of straightening out the hump of the back, so often left after disease of the spine, by stretching the child on a flat table and dealing with the hump, under chloroform, with what is commonly known as “ brute force.” A considerable number of hump-backed children on the Continent as well as in England and America were thus dealt with, but it is doubtful whether the records of those cases, could they all be collected and published, would be found to justify the enthusiasm and publicity with which the method was inaugurated and its details were spread abroad. It is scarcely necessary to say that the forcible straightening of a spine which has, developed a hump because tuberculous disease has wrecked the front of the vertebral segments is in no sense a *curative* operation. Diminishing the size of the projection does not cure the tuberculous ulceration of the bones; indeed, it may increase the ulcerative process or determine a scattering of the germs of tubercle throughout the body. The operation has not been accepted by British and American surgeons. In the practice of the foreign surgeon death ensued in three cases out of thirteen that were operated on, and an English surgeon reported fourteen cases “ in all of which the deformity had recurred although the spines had been fixed in plaster of Paris after the straightening. "

Being deeply placed in the mass of the muscles of the back, and, moreover, being jealously locked within the bony canal of the vertebral column, the spinal marrow or spinal cord was, until the last few years, generally considered to be beyond the reach even of the most enterprising surgeon. Still, like other tissues, it was liable to diseases and injuries. The exact situation *of* a tumour pressing upon the spinal cord can now be located with great precision by noting the areas of pain and numbness, and the height in the limbs or trunk to which loss of power of voluntary movement ascends, and by noting also whether these effects are symmetrical upon the two sides or appear more upon one side than on the other. By cutting away the posterior parts of certain segments of the vertebral column, tumours of various sorts have been successfully removed from the interior of the canal. Displaced fragments of bone in tuberculous affection of the spine, abscess-contents and inflammatory tissue have also been similarly dealt with. Sir William Macewen of Glasgow and Sir Victor Horsley of London have been pioneers in this development of surgery. In cases of fracture of the spine, with displacement of the vertebrae and compression of the spinal cord, surgeons have also been trying what relief can be afforded by the adoption of bold operative measures, but as in most of these cases of fracture-dislocation the spinal cord is torn right across or crushed beyond hope of repair, active measures cannot be undertaken with much prospect of success.

*“ Concussion of the Spine."—*Occasionally one hears persons, whose professional education should have taught them better, speaking or writing of concussion of the spine as if that were in itself a disease. ’ It is an expression which is not infrequently used in an equally comprehensive and incorrect way when the ill-informed person is speaking of the injuries, real or imaginary, of which an individual makes complaint after having met with a severe shake when travelling on a railway. One might as well speak of concussion of the skull as of concussion of the spine, for the spine is but the bony envelope of the spinal cord, as the skull is of the brain. The violent shaking of the spinal cord and the spinal nerves in a serious accident may, however, be followed by some functional disturbance, which may be associated with pains in the back, by numbness and tingling in the limbs, or with muscular weakness. In some cases the disturbance is due to slight haemorrhages into the nerve sheaths, which may clear up with rest and quiet. But when the presence of these obscure symptoms, after a railway accident for instance, becomes the subject of an action-at-law, there is a great chance that they will not pass off until the case is settled in one way or the other. Not, perhaps, that the individual concerned is dishonest in his estimation of them, but because the anxiety of the overhanging lawsuit has so grievously disturbed his mind and altered his perspective that his sense of proportion is for a time in abeyance. After the action-at-law the symptoms may clear up with a rapidity which to some people appears surprising. (E. O.\*)

Physiology of the Spinal Cord

The name spinal cord, given by early morphologists to the nervous mass lying in the tubular chamber enclosed by the vertebral column, was doubtless given under the supposition that the organ so named could be treated as an entity. Scientifically, however, it cannot be so treated, either as regards its structure or its function. It is merely a part of that great nervous structure which throughout the length of the body forms the central meeting-place of the nerve-paths arriving from and issuing to all regions with which nerve fibres are in touch. To separate from the rest of this system the part which lies within the spine is an artificial and in many ways misleading provision. This artificial treatment is the outcome of crude ideas drawn from the study of merely the gross form of the bodily parts. But crude as the distinction is, its historic priority has influenced the study of the vertebrate nervous system, not only in regard to morphological description but also in regard to exposition of the functional reactions of the nervous system and even up to the present day. Hence it is still customary arbitrarily to detach certain of the reactions of the nervous system into a separate group and describe that group by itself, simply because they occur in nervous arcs whose central courses in the great central nervous organ lie within that part of it extending along the spine. An additional inconvenience attaching to the mode of description of the nervous system customary in works on human anatomy, is that in such works the parts of the nervous arcs outside the central organ are described apart from it under the term peripheral nerves. This severs artificially structures which are functionally in- dissolubly united. The study and description of the working of the nervous system is hampered by this unphilosophic sub- division of its structural parts.

To gain a broader and truer point of view as starting-point for understanding the working of the spinal cord one must prepare the exposition by a short reference to the general function of the nervous system in the bodily economy.

*Relation to General Nervous System.—*An animal of micro­scopic size may continue throughout its life to be constituted entirely by one single cell. Animals of larger bulk, although each begins its existence as a single cell, attain their development by the multiplication of the original single cell, so that from it there comes to be formed a coherent mass of cells very many millions in number. In these multicellular animals each of the constituent cells is a minute self-centred organism, individually born, leading its own life and destined for individual death. The corporate power of the complex animal is the sum of the powers of those manifold individual existences, its cells. In the complex animal the several organs, even the most homo­geneous, such as muscles or glands, are each composed of many thousands of cells similarly specialized but living each *per se.* The solidarity of action which a complex animal thus built up exhibits is the result of the binding together of the units which compose the complex organism. Of the agencies which integrate the complex animal, one of the most potent is nervous action. A certain number of the unit cells composing the animal are specially differentiated from the rest to bind the whole together by nervous action. These specially differentiated cells are called “ neurones.” They constitute living threads along which waves of physico-chemical disturbance are transmitted to act as releasing forces for the energy in distant cells, where they finally impinge.

It is characteristic of this nervous system, the system of neurones, that, although ramifying far and wide through the body, it is a continuum from end to end. The peripheral nerves are formed of bundles of neurones lying side by side, but these, although packed close together, are strictly isolated one from another as conductors and remain isolated throughout the whole length of the nerve. The points of functional nexus of the neurones one with another are confined to one region only of the whole system. All their conductive connexions one with another take place solely in the central nervous mass which constitutes the so-called central nervous system, a nervous organ extending axially along the length of the body midway between the body’s lateral halves. Thither the neurones converge in vast numbers, those of each body segment converging to that fraction of the central organ which belongs to their body segment. The central nervous organ thus receiving these neurones is, where it lies in the head, called